

RATE PROBLEMS

CROSSROADS ACADEMY
MATHCOUNTS PREPARATION

1. RATE FORMULA WARM-UP PROBLEMS

- (1) If Jane goes 8 miles per hour for 22 hours, how far does she travel in total?
- (2) If John drives at a constant rate of speed for 6 hours and travels 2,400 miles, how fast is he going? What form of transportation is he most likely using?
- (3) If Jack and Jill roll down a 1 kilometer hill at 2 meters per second, how long does it take them to reach the bottom?
- (4) If Alice and Bob start running a race at the same time and Alice runs at 4 miles per hour and Bob runs at 3 miles per hour, how long will it be until Bob is 2.5 miles behind Alice?
- (5) Carla and Dan both run a lap around a long track. It takes Carla 2 hours to finish her lap. If Carla runs 5 miles per hour faster than Dan, and it takes Dan 4 hours to finish, how long is the track?
- (6) Erica and Fred leave home at the same time and ride their bicycles for the same amount of time. Erica rides her bike East at 24 miles per hour while Fred rides North at 20 miles per hour. If Erica travels 10 miles farther than Fred how long did they ride? How far apart are they when the finish riding?
- (7) Grace and Henry both ride the same train to work every morning. Grace rides for 75 miles and Henry rides for 50 miles. If Grace rides for 2 hours longer than Henry how fast does the train go?
- (8) If 10 workers paint a house in 6 hours? How many workers does it take to paint 100 houses in 6 hours? How many houses can 10 workers paint in 100 hours? How many hours does it take 100 workers to paint a house?

2. CONSTANT RATE PROBLEMS

- (1) Train 1 and train 2 leave the same station at the same time. If train 1 goes east at 40 miles an hour and train 2 goes north at 30 miles an hour how long is it until the trains are 50 miles apart?

- (2) At 1:00 bus 1 is 45 miles ahead of bus 2. If bus 1 travels at 55 miles an hour and bus 2 travels at 70 miles per hour what time is it when bus 2 catches bus 1? What time is it when bus 2 is 45 miles ahead of bus 1?

- (3) Two cars start driving towards each other beginning 1000 miles apart. If car 1 travels at 60 miles per hour and car 2 travels at 40 miles per hour how long does it take them to meet? How far away from the starting position is car 1?

- (4) In an hour a boat can move 80 meters upstream or 120 meters downstream. If the speed of the boat is 20 meters per hour with no current, how fast is the current?

- (5) A robot walks from his house to the scooter store at 4 miles per hour and then road a scooter back home at 10 miles per hour. If the round trip took 2 hours, how far did the robot walk?

- (6) Tractor 1 and tractor 2 are separated by 200 miles and begin driving towards each other. Tractor 1 drives at a constant rate of 10 miles per day. Tractor 2 starts at 1 mile per day and triples his speed every 24 hours. How long does it take for the tractors to meet?

- (7) Two trains are traveling in the same direction, one at 100 miles per hour and one at 80 miles per hour. A man sitting in the slower train noticed that it took 1 minute for the longer train to pass him. How long is the faster train?

3. RATE AVERAGES AND WIDGETS

- (1) If a car travels for 2 hours at 50 miles per hour and 2 hours at 100 miles per hour, what is the average rate of speed for the whole trip?

- (2) If a car travels for 6 hours at 50 miles per hour and 8 hours at 100 miles per hour, what is the average rate of speed for the whole trip?

- (3) If a car drives 50 miles at 6 miles per hour and another 100 miles at 8 miles per hour, what is the average rate of speed for the whole trip?

- (4) If a car drives 50 miles in 6 hours and another 100 in 8 hours, what is the average rate of speed for the whole trip?

- (5) If person 1 makes 12 widgets per hour, person 2 makes 10 widgets per hour, and person 3 makes 22 widgets per hour how many widgets can they all make in 2 days?

- (6) If 10 people can make 6 widgets in 4 hours how many people are needed to make 8 widgets in 6 hours?

- (7) If 12 people make 100 widgets in 8 hours how many widgets do 60 people make in 5 hours?

- (8) If 15 people make 1 widget in 7 hours how many hours are needed for 8 people to make 2 widgets?

- (9) If 3 painters can paint a house in 2 days how many painters are needed to paint 4 houses in a week?

- (10) Each worker makes 3 widgets per hour. At 8am there are 7 workers in the factory and every hour a new worker arrives. How many widgets are made by 6pm?